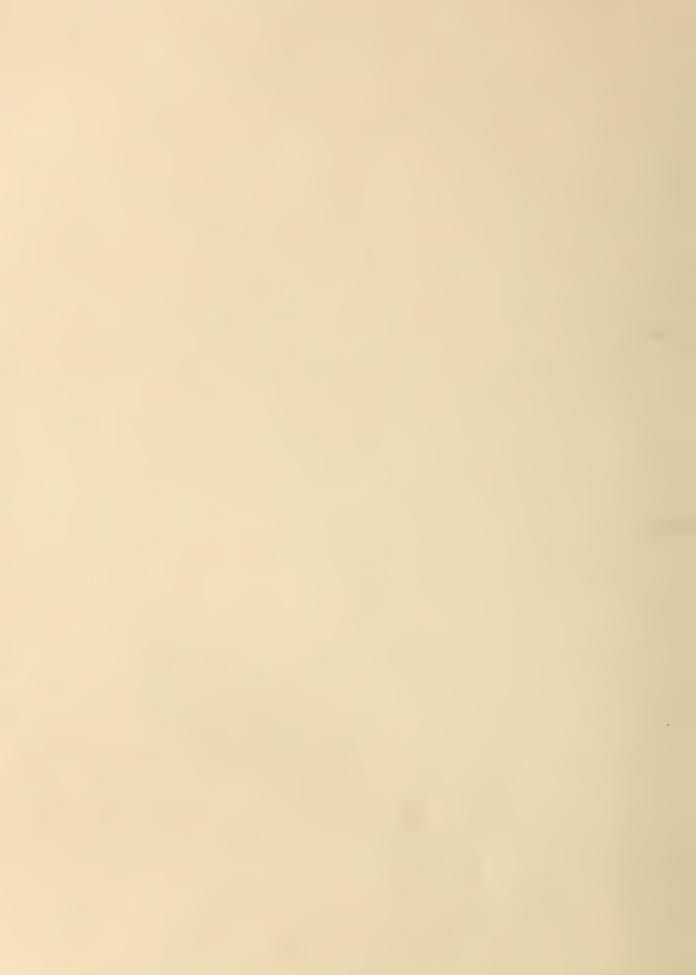
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Platte and Arkansas Drainage Basins

Ву

Division of Irrigation, Soil Conservation Service United States Department of Agriculture and Colorado Agricultural Experiment Station

Data included in this report were obtained by the agencies named above in cooperation with the U. S. Forest Service, National Park Service, State Engineers of Colorado, Wyoming and New Mexico and other Federal, State and local organizations.



As of -

FEB. 1, 1951



FEDERAL-STATE COOPERATIVE SNOW SURVEYS AND IRRIGATION WATER SUPPLY FORECASTS

FOR

PLATTE-ARKANSAS RIVER BASINS

Report Prepared

by

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and

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Miscellaneous Series Paper No. 477 Colorado Agricultural Experiment Station



WATER SUPPLY OUTLOOK PLATTE-ARKANSAS DRAINAGE BASIN February 1, 1951

Snow accumulation to February 1 was above normal on these watersheds except for southern tributaries to the Arkansas. On the South Platte and its tributaries snow cover in the high mountain areas is well above normal for this date. Snow cover on the North Platte watershed is slightly above normal. Precipitation in valley areas has been deficient for several months and soil moisture conditions are described as fair to poor. Stream flow is generally below normal. Storage in most reservoirs for irrigation purposes is much below last year and the past ten year average.

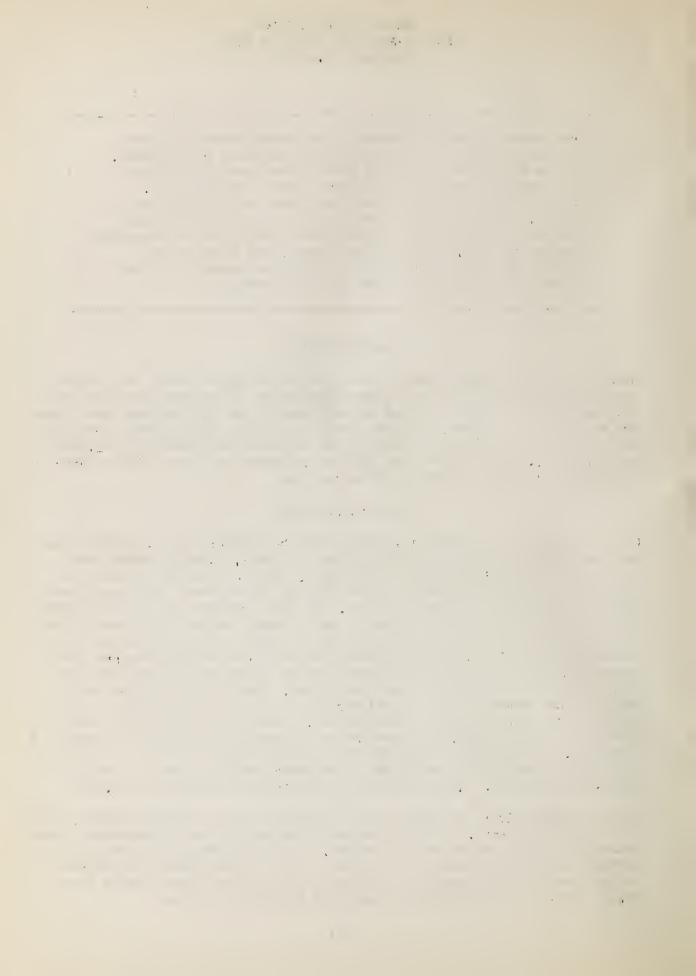
CHEYENNE RIVER

Snow cover in the Black Hills of South Dakota is below normal and similar to a year ago as of this date. Precipitation in the valley areas near the mountains has been deficient for several months and soil moisture conditions are reported as very dry. Stream flow is normal to below normal. Storage in Belle Fourche reservoir is now 75,000 acre-feet as compared to 61,000 on February 1, 1950. Storage in the new Angostura reservoir with a capacity of 160,000 acre-feet is now 27,000 acre-feet.

NORTH PLATTE RIVER

On the mountains southwest of Lander on the Sweetwater River Watershed the snow accumulation to date is 115 percent of normal. Similar monditions exist on the North Platte River in Wyoming. Most of the snow courses on the North Platte were measured before the end of the month and considerable snowfall has occurred since that time. In the mountains surrounding North Park the snow cover is also slightly above normal except in the Rabbit Ears Pass area where unusually heavy snow cover exists. Precipitation in valley areas from North Park, through Wyoming and into Western Nebraska has been somewhat deficient during the fall and winter months and the soil is very dry. Stream flow is reported as about normal. Adequate irrigation water supplies are assured below the major reservoirs in Wyoming because of the heavy runoff in the 1949 snow melt season. Total storage in these four reservoirs is now 1,631,000 acre-feet as compared to 1,628,000 on February 1 last year. This is near three times the past ten-year average. In the Kingsley and Sutherland reservoirs in Nebraska there is stored a total of 1,826,000 acre-feet. A year ago the total storage was about 1,700,000.

On the Laramie River the snow cover is somewhat above the North Platte, about 150 percent of normal. This is partially because of snow measurements taken after the general storm late in January. Soil moisture conditions in the Laramie and Wheatland areas is very dry. Four to six inches of snow was on the ground as of February 1. Storage in Wheatland Reservoirs is now 36,000 acre-feet as compared to 44,000 on February 1, 1950.



SOUTH PLATTE RIVER

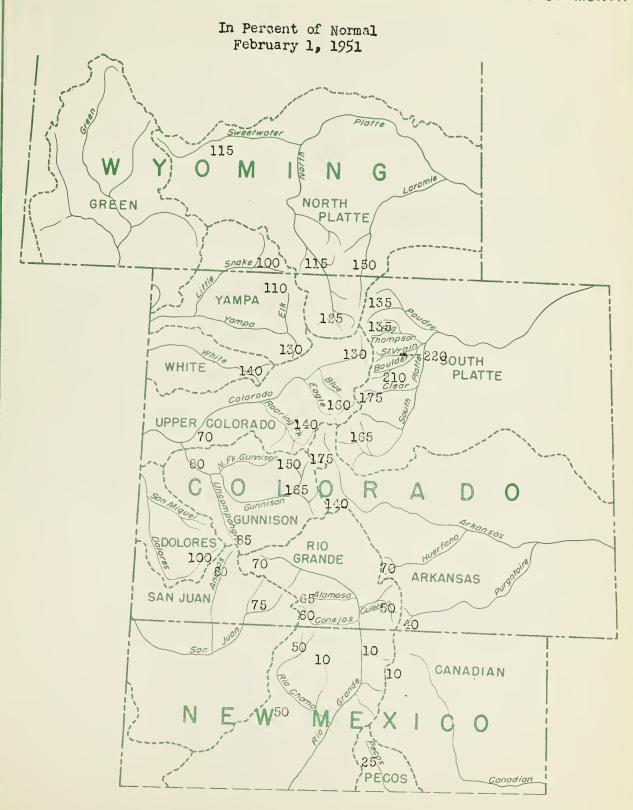
The irrigation water supply outlook for the South Platte and its tributaries is above average for this date. The snow cover on the whole watershed is well above February 1 a year ago, In respect to past average the snow cover ranges from about 135 percent of normal on the Foudre and Big Thompson drainages to 220 percent of normal on the Saint Vrain. Clear Creek is now 175 percent of normal and the Upper South Platte 165 percent. However it should be noted that only about one-half of the seasonal snowfall occurs by February 1 and any estimate of summer runoff must be subject to snowfall that may occur later in the winter. It is also necessary to note that a normal runoff will not necessarily provide adequate irrigation water supplies in the South Platte Valley. Storage in irrigation reservoirs is much below last year and generally below average which will restrict supplies for early irrigation if necessary. Stream flow is reported as below normal in all areas. Precipitation has been deficient in the valley areas for several months and in the mountains during the fall months. Soil moisture is dry throughout the valley.

ARKANSAS RIVER

There is considerable variation in snow accumulation to this date. In the Leadville area the mountain snow cover is about 175 percent of the February 1 normal. Near Monarch Pass it is about 140 percent. On the headwaters of the Huerfano, Cucharas and Purgatoire Rivers a definite deficiency in snow cover exists. Soil moisture conditions in the valley areas are described as extremely dry, especially on the Purgatoire. Stream flow is generally below normal. Precipitation has been below average in the valley during the fall and early winter months. Storage in irrigation reservoirs is much below a year ago and the past ten year normal, This will restrict the use of early irrigation water if necessary.



WATER CONTENT OF SNOW ON THE WATERSHEDS OF PLATTE, ARKANSAS, UPPER COLORADO AND RIO GRANDE BASINS BASED ON SNOW SURVEYS MADE APPROXIMATELY FIRST DAY OF MONTH





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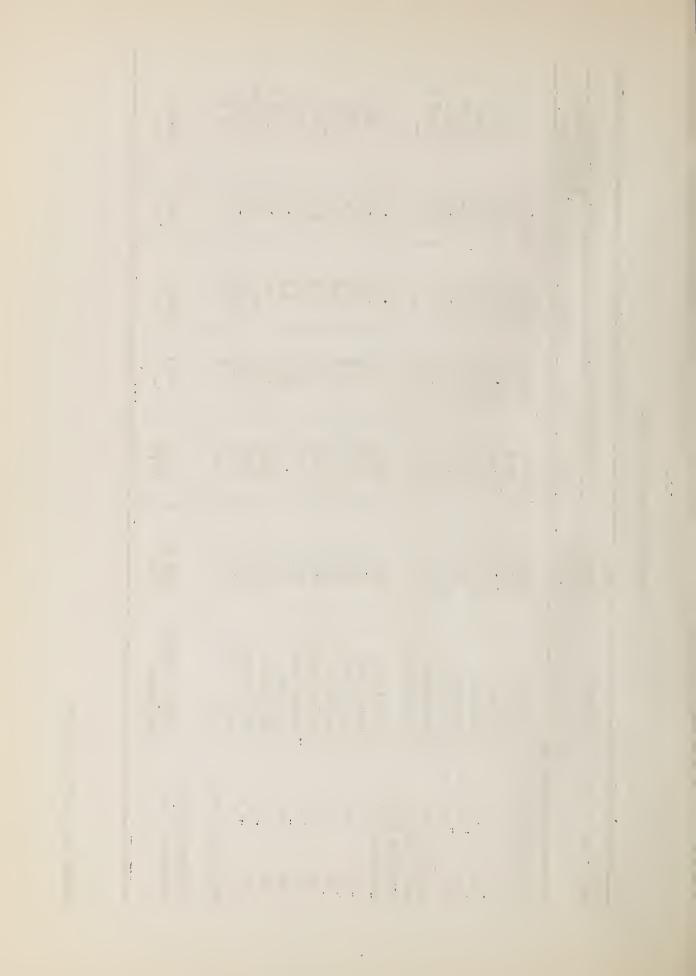
STATUS OF RESERVOIR STORIGE, PLATTE-ARKANSAS RASIN, February 1, 1951

BASIN AND STREAM	RESERVOIR	USABLE CAPACITY	THOU	THOUSANDS ACRE	FEET IN ST	STORAGE Abou	About February 1
		(Thous. A.F.)	1951	1950	1949	1948	10-year Avg.* 1941-1950
MISSOURI RIVER							
Poudre River	Windsor	18,6	0°7	9°6	2,2	11.6	v v
	Cache la Poudre	9,5	7.8	6. 2	2,3	4,3	2.0
11 11	Fossil Creek	11.6	ν, ν	6.5	y Ž	8,1	5.0
=======================================	Terry Lake	8,2	4.1	4.1	2.7	7.0	7.0
11 11	Halligan	7'9	0°0	0.0	9,0	0.0	1,1
	Chamber's Lake	8,8	1,5	1,8	1.1	4,1	2,3
#	Copp Take	34,3	0,0	11,4	3.9	Z, 2	7.4
11 11	Black Hollow	8,0	0,7	5.7	2,3	4,3	3.6
Big Thompson River	Lake Loveland	14,3	3,6	5,7	1,5	6,5	14.2
11 11	Boyd Lake	14,0	15,5	25,4	20°5	30.1	18,5
	Lone Tree	9.2	ν, ν,	5,1	۳. ۳.	8,0	25.4
n n	Mariano	5,4	0,2	٦ رو	0.2	2.1	1.2
St. Vrain River	Union	12.7	3.4	9,1	6,1	10,6	6.9
Boulder Creek	Barker Meadow	11,7			4.6	7.9	7.47
South Platte River	Eleven Mile	81.9	72,0	81.9	81,9	81.9	81.9
	Cheeseman	79.0	27,0	63.0	51,8	77,3	62.5
	Marston	18,9	9,3	14,8	11,8	14,0	14.8
11 11	Barr Lake	32,2	13,2	20,1	24,3	24.3	19.8
E E	Milton	24.4	1,8	14,5	11,2	15,5	10.1
	Standley	18.5	4.9	6.7	8,2	13.0	9.3
n u	Marshall	10,3	1,1	1,2	0,3	2,3	2,0
n n	Antero	33.0	19,8	21,0	19.8	21,0	15,7
11	Horse Creek	20,6	7.1		10.2	10.9	7,6
	Riverside	57.5		144,7	28,1	53.2	39.2
11 11	Empire	37.7		27.6	24,27	28°6	23.8
11 11	Jackson Lake	35.4		31,5	21,5	27.4	27.4
2 2	Prewitt	32.8	15,2	28,8	16,4	30.6	20.6
n n	Point of Rocks	70.0	36.4	9°09	30,1	67.8	76,9
=======================================	Julesburg	28.2	20,1	20.1	20,4	20.4	20.4
*Some for shorter periods	riods	-					-



	10-year Avg.* 19411950	0		3 67.3					7.000							7 34.7							0 106.5	1	
E Abou	1948	1544.0	18.	109,3	685,	17° 1	505	9,69	1		36.8	10,3	9%	26,6	15,(43,7	17,	÷ †	35,5	110.9	٦		140.0	1	
THOUSANDS ACRE FEET IN STORAGE About February	1949	1597.4	16.1	129,1	520.5	15,6	1,07.2	27,8	1		22.3	7.4	7.3	14.6	9,1	30°3	8,2	1	128,8	89.5	1,5	,	116,5	1	
DS ACRE FEE	1950	1679,0	25,3	155.1	647.2	45.9	780.0	43.9	15.0		21.9	6,3	2.9	5.7	7,3	29.8	4,5	18,9	149.6	68,6	9°0		61,3	ł	
THOUSA	1951	1783.0	29.6	170.6	642.0	36.8	771.8	36.0	13,0		10,5	7,8	0,3	0,0	000	000	2,3	34.2	74.0	1,7,8	7.0		75.1	27.0	
USABLE	$(\text{Thous.} A \cdot F_{\circ})$	2180,0	8,09	190.0	1025,0	0~917	1045.5	70° 4			57.9	17.04	11,04	14.9	56,9	9°19	0.01	10,9	655,0	150.0	15.0		198,1	160,0	
RESERVOIR		Kingslev	Minatare	Alcova	Seminoe	Guernsey	Pathfinder	Wheatland	Sutherland		Twin Lakes	Sugar Loaf	Clear Creek	Meredith	Horse Creek	Adobe Creek	Cucharas	Two Buttes	John Martin	Great Plains	Model		Belle Fourche	Angostura	
BASIN AND STREAM		North Platte River	11 11		=======================================	=======================================	Garante de la companya de la company	Laramie River	North Platte	ARKANSAS RIVER	Arkansas River	11	11	11	\$2.2 64	der der	=	=	11	11	Purgatoire River	danta annavano	Cheyenne River-		

*Some for shorter periods



SURMARY OF FEBRUARY 1 SNOW SURVEYS AND COMPARISON OF DATA

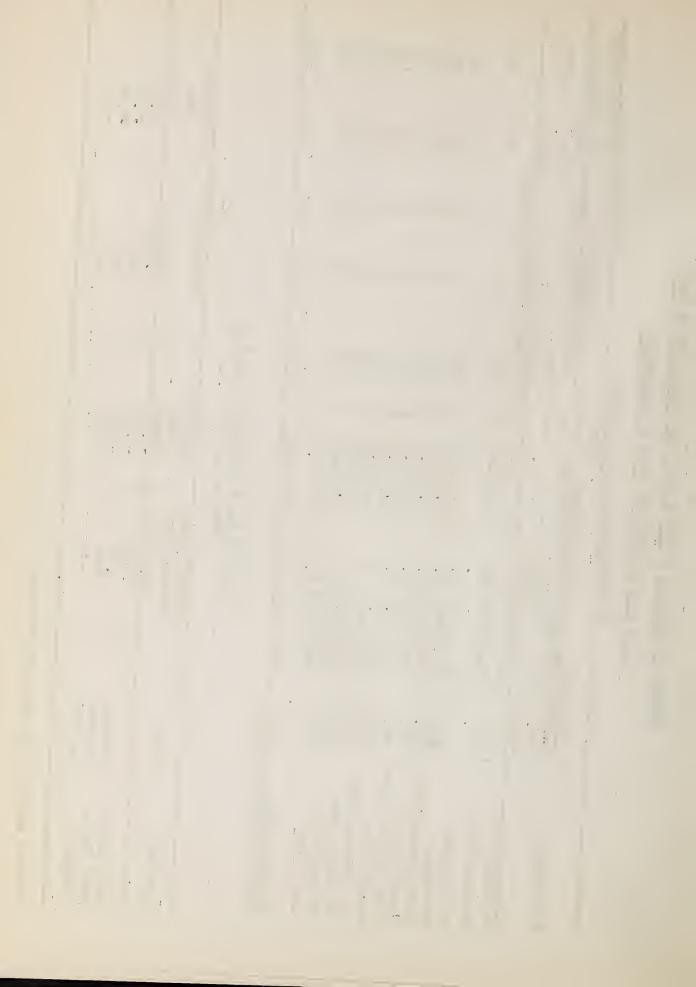
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	Snow Depth	epth		Water Content	Conten		Courses	Snow Density	ensı ty		In percent or	211 OI
WITERSHEDS	Fourteen 1950 1951	1950	1951	Fourteen 1950 195	1950	1951	'n	Fourteen	1950	1951	Fourteen	1
30.00	Year	m.e.so		year			Average	year			year	1950
	AVg.*	-mh wa*		AVBo*				avg.*			Avg.*	
CHEYENNE RIVER	In.	In	Tu.	In.	In	In.		Fercent	Fercent	Percent		
Cheyenne River	19.3	12,6	12,6 11.5	3.5	2.2	44	m	18	17	17	54	98
PLATTE RIVER												,
Sweetwater	37.3	57.7	40.4		15.5	10.4	~	2Д	27	56	114	29
North Platte River	42,1	13.8	47.7	10,8	11,97	12,5	10	26	27	56	116	107
Taramie River	28.7	30.2	39.2		7.6	10.8	9	25	25	28	150	142
liver**	20.5	17.9	29,6	3.7	3.0	6.1	m	18	22	21	165	202
	26.6	25.8	34.4	2.0	9.9	9.3	١٨	26	28	27	133	141
	37.9	38,5	18.8	6.6	0.6	13.5	2	26	23	28	136	150
St. Vrain River	29.9	37°4	54.3	7.1	8,1	15.7	Н	24	23	29	220	187
Bonl der Creek	37,0	27.8	57.7	10,1	6.7	20.2	۲-۱	28	24	W 77	200	300
Clear Creek	35.4	36.0	36.0 52.0	8.4	8.3	14.9	2	24	23	29	177	180
			,	•		-		(((ì.	ר
LRKINSAS RIVER	27.3	23.5	23.5 37.6	5.8	4.4	η• _Ω	6	21	179	7.7	145	171
*Some for shorter periods	riods											

PRECIPITATION DATAM February 1, 1951

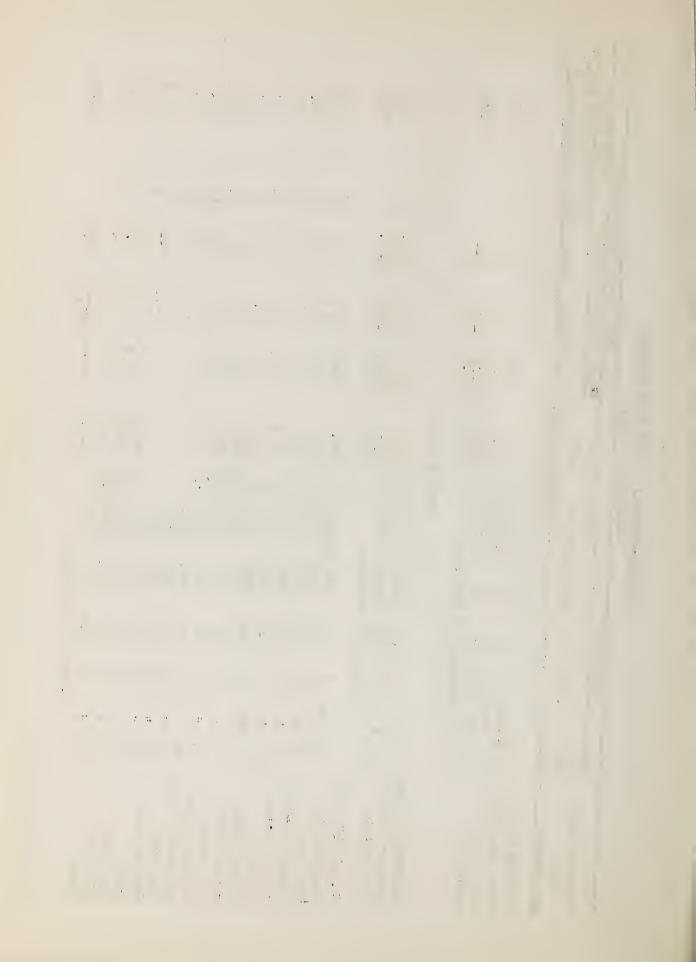
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		Precipitaton	Departure	Frecipitation	a.rno.reden
WATERSHED	STITE	October 1 to	from		from
		January 31	Normal	January	Normal
		Inches	Inches	Inches	Inches
North Platte	Wvomine	3, 60	0.03	1,28	寸·0·
C +11 - 12 + 1 + 1			711	0.87	0.70
South Flatte	CoTorado	777.9	00.01		
Arkansas	Colorado	2,52	-1.40	1,21	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\
	ar a		2.00		
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PLATTE-ARKANSAS RIVERS SNOW SURVEYS February 1, 1951

1	1			1																													
	ഗ	Past Record	AV, Ma	tent(Inches)		1.3	ς α	, 0	†† ° C	C*C			9.3	8,8	9,1		11.8	بر بر،	13,2	6.9	2,9	7.8	10.1	18,3	16,2	11,3	6,57	14,1	8 %	6,3	1,4	0	TO°O
7	rement	(Yrs, of	Rec.		7	- 🗸	7 (_				0	. 0			12	<u>n</u>	15	7	Н	13	13	13	13	13	13	<u></u>	2	2	_		Tr Minneyaman.
	Snow cover measurements	Content (Inches	-	1949		8 7		บ ป ()	14° >	o v			11,1	12,2	11,6		16.5	8,6	19,6	12,4	I	13,8	18,7	28.1	24.1	17,0	11,5	Į	12,1	9.2	1		T./ ° O
	Show 50	Content		1950		0) [, L		707			16,2	14,8	15.5		12,3	6,1	11,0	8,4	2.9	11,0	13,5	22,6	16,3	10,3	ν, ν	14.1	7.04	ر ش	7,7		11.
		Water		1951	No. Manusco, until Article State	2	2 0	000		L, 7	na ser se sila non		10,2	10,6	10.4		17,0	5,7	20,9	6,8	3,7	7,3	10.9	19,3	17.4				12,8	1,07	2,0		
7 1, 1951		Bnow	Depth	nches)	RI RIVER	0 2 5	7 0	7.4		11.5	E RIVER		11,6	39.1	10°1	halls do 1 horbigo	49.8	30,0	70.2	36,5	22,2	31,6	0.14	63.4	65.6	A-Th-year const	4		15,6	15,0	12,1		MT TORAGO
February L,		Date	Eleve of	Survey	MISSOURI	KKOO 2/1	1/2 0000	1/2 0000 16/ 1 0009		Φ.	PLATTE	.,,		9000 1/25							8500 2/2				10200		8400		9400 2/2		9000 1/27	8900	
			Range E					리 [五2.	Drainage	***************************************		100W		a 96			78W				177 Lake 1.16			801		8118	8511	7811	7411	75	85.	Drainage
	Location		Twp.			NC	7 5	Z Z	-	ge Ior		need der Veren	30N	30N	for		en 9	Z	N	TIN	H	14N	-	177	16N	16N	16N	15N	14N	27N	30N	12N :	for
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		Drainage Basin		Snow Course		CHEYENNE KIVER	Upper Speariish	Upper Castle	Deerfield			CHITCH THE DIVIES	Grannier Meadows	South Pass*		NO. PLATTE RIVER	Cameron Pass	Park View	Columbine Lodge	Willow Grapass*	Northeate	Bottle Greek	Mehher Spring	old Battle	NeFrench Creek	N. Barrett Creek	Ryan Park	Spring Creek	Albany	La Bonte	Boxelder	Pearl	

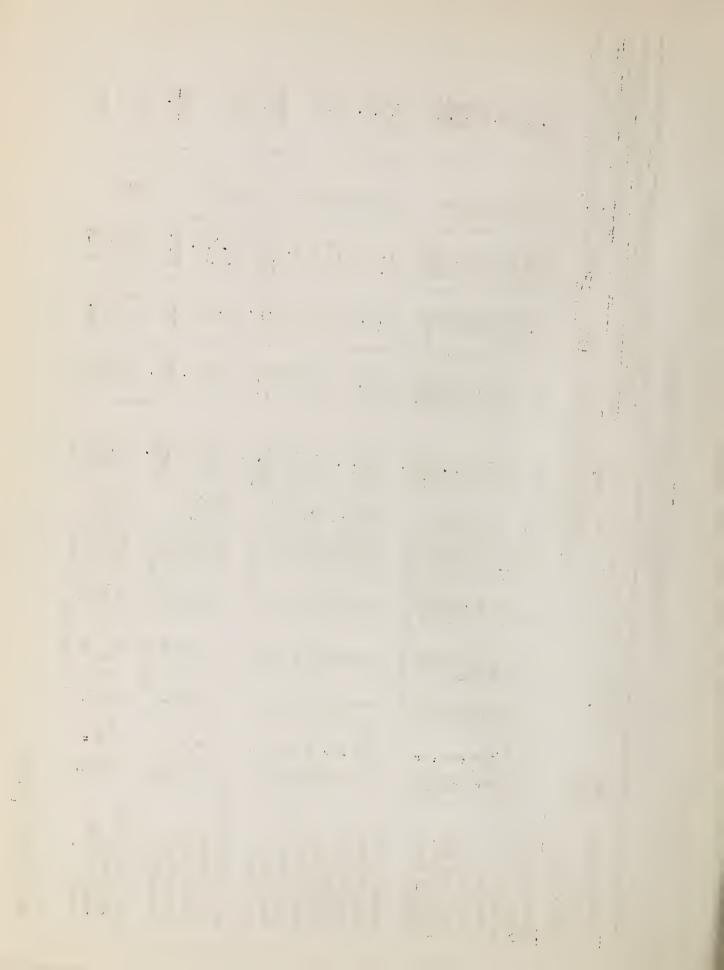
*On adjacent drainage



-7-PLATIE-ARKANSAS RIVERS SNOW SURVEYS February 1, 1951

		-			repruaty	19 1771		C		-	
		Location						Snow Cover	r measurement	rement	
Drainage Basin	No.	Sec.	Twp。	Range	Elev. Date	Snow	Later C	Content ((Inches)		Past Record
and Snow Course	and State					or Depth Survey(Inches)	1951	1950	1949	Yrs.of Rec.	Av. Water Content (Inches)
					PLATTE	PLATTE RIVER					
LARAMIE RIVER											
Roach	88 0010	rv i	TON	M22	9800 1/27	1,8.2	13.2	ω \ σ, ι	15,0	10	10,1
	_	<u>بر</u>	NOT			-		ر ن ه	10°5	2.7	T % 2 -
Brooklyn Lake	3 Wyo.	H	16N			7-79	20,8	15.7	19,7	ET.	13.9
	щ.	27	13N	781		31.0	2.9	3,1	တ္ '	14	4.9]
Pole Mtn #2*	ار الرار الرار	۳, در	15N	72%		Ja Ma	ر در در د	L, C	60	174	റ്റ
Libby Louge Hairpin Turn	36	27	16N	382	1/2/00/6	10°0		, O. - ω	11,0	12	ったっ
Albañy	= 89	18 Àv	a	787 for dra		19.5	12.8	7.7	12.1	2	9.8
POUDRE RIVER					0))		, ,			
Cameron Pass	1 0010	2	N9		10300 2/1	149.8	14,0	12,3	16,5	12	11.8
Chambers Lake	2 "	9	Z			24.8	6.7	4.1	9.1	12	7.0
Big South	≈	33	8N		8600 1/27	7.0	1.8	1.9	4,5	12	1,6
Deadman Hill	50.	56	TON		nd broken stransson	-		1	1	11	
Lake Irene*	e5	∞	SN SN			57,3	17.8	10,7	19.3	12	13,3
Glass Lake	u 89	18	ZN.	731	9500 2/2	33.3	6,3	3,9	1	10	3.9
Red Feather	128 "	56	TON	2/t of		23.6	7, 8, 1,	7,0	0.6	2	
Lost Lake	156 "	32	8N	751		30.5	0,8	1	1		
		AV	Average f	for dra	drainage	34.4	9,3	9.9	12.4		7.0
BIG THOMPSON RIVER	<u> </u>					,				((
Lake Irene*	e2 =	∞	K.		<u> </u>	57.3	17,8	10.7	19.3	12	
Hidden Valley	25	23	Z,	75%	16/1 9550	10°3	۲,8	ر س ر	0,0	90	6.5
idge	115 "	13	<u> </u>		-	23.8	4.3	೦ ಗ	(°)	.7	
Longs Peak	148 "	35			10500	ķ		ľ	1		
		AV	Average i	for dra	drainage	2.27	13.5	0.6	15,1		7,0
ST. VRAIN RIVER		-			-	a Dr. Aspermane		-	-	(
n	41 Colo	24	NE Z	74w	10000 2/1	54.3	15.7	α α α	14.4	ವ ೧	1.1
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ward	T3t	'		Y .		22.0	7:7	7.7	1	1	
	and the state of t	AV	Average i	ior ara	araınage	54.3	15.7	7.0	77°77		7.1
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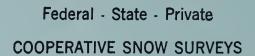


PLATTE-ARKANSAS RIVERS SNO. SURVEYS February 1, 1951

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Correspond	10	7	1949 R	3.1	13.0		00000000000000000000000000000000000000
O SO CART		CONTRAIN	1950	4.2 4.9 1.9	81 3.90° ° ° ° ° ° ° ° ° ° ° ° ° ° ° ° ° ° °		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
	*0+0F	Manor	1951	20.2	114.0 115.7 14.5 14.5	10,01	00000000000000000000000000000000000000
77	Snow	Depth	(Inches)	57.7	7, 7, 8 7, 7, 8 7, 0, 8 7, 0, 8 7, 0	14, 0 14, 0 19, 7 19, 7 8, 5	100 20 20 20 20 20 20 20 20 20 20 20 20 2
1, 175	79+0	Date of	Survey	1/27	1/26	11400 1/31 4 10000 2/1 10100 1/31 3 9750 1/31 1 9200 1/30 2 8950 1/30 2	10000000000000000000000000000000000000
February		F.lev,	,	9400 10300 9400	10600 11250 9650 10500	()	10200 10500 10800 10500 9300 9300 9700 11100 10600
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		Two.		22.	ton market	133 88 88 88 88 88 88 88 88 88 88 88 88 8	37°28 118 128 118 118 118 128 128 1
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	Transfer Dogs	Drainage basin	Snow Course	BOULDER CREEK E.Port.Moffat T. University Camp	CLEAR CREEK Loveland Pass Grizzly Peak* Empire Berthoud Falls	SOUTH PLATTE RIVER Hoosier Pass Fairplay Jefferson Cr. Geneva Park Antero Deer Creek	Tennessee Pass Twin Lakes T. Marshall Pass Poncha Creek Whiskey Creek La Veta Pass* 4-Wile Park Fremont Pass Monarch Pass St. Elmo Timberline







Furnishes the basic data necessary for forecasting water supply for irrigation, domestic and municipal water supply, hydro-electric power generation, navigation, mining and industry

"WATER IS THE WEST'S GREATEST RESOURCE"